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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/767,490	01/28/2004	Motomi Matsunaga	1232-5261	5062
27123	7590	06/27/2005	EXAMINER	
MORGAN & FINNEGAN, L.L.P. 3 WORLD FINANCIAL CENTER NEW YORK, NY 10281-2101			PRITCHETT, JOSHUA L	
			ART UNIT	PAPER NUMBER
			2872	

DATE MAILED: 06/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

H.A

Office Action Summary

Application No.

10/767,490

Applicant(s)

MATSUNAGA ET AL.

Examiner

Joshua L. Pritchett

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 January 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 11/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the optical path claimed in claims 20 and 24, if the applicant wishes the claimed events to occur in order must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 2, 4-6, 13-17 and 26 are rejected under 35 U.S.C. 102(e) as being anticipated by Takeyama (US 2002/0039232).

Regarding claim 1, Takeyama discloses an optical system comprising a plurality of optical surfaces (3 and 4₁-4₅) including a first surface (4₄ and 4₁) on which light rays from an object (5) are incident (Fig. 1) and which has at least a reflective action (Fig. 1), and a second surface (4₂) reflecting the light rays reflected by the first surface back toward the first surface (Fig. 1); wherein the first surface reflects a central field angle principal ray (2), which comes from the second surface and is again incident on the first surface, to the opposite side of the previous reflection with respect to a normal at a hit point of the central field-angle principal ray on the first surface (Fig. 1); and wherein the plurality of optical surfaces includes a diffractive optical surface (3; Fig. 1). Surfaces 4₁ and 4₄ are considered to be a single surface because they appear to be a part of the same continuous curve.

Regarding claim 2, Takeyama discloses the first surface is decentered with respect to the light rays from the object (Fig. 1).

Regarding claim 4, Takeyama discloses the first surface and the second surface are formed on a transparent member filled with an optical medium (Fig. 1; para. 0126).

Regarding claim 5, Takeyama discloses the diffractive optical surface is one of the plurality of optical surfaces other than the first and the second surface (Fig. 1).

Regarding claim 6, Takeyama discloses the first and the second surfaces are formed on a first transparent member filled with an optical medium (Fig. 1) and wherein the diffractive optical surface, which is not the first or second surface, is formed on a second transparent member filled with an optical medium (Fig. 1). Fig. 1 shows that diffractive element (3) has depth and that the reflection and diffraction occurs at the back surface of the medium.

Regarding claim 13, Takeyama discloses the diffractive optical surface has a reflection action (para. 0127; Fig. 1).

Regarding claim 14, Takeyama discloses the diffractive optical surface has a transmissive action (para. 0127; Fig. 1).

Regarding claim 15, Takeyama discloses the light rays from the object form an intermediate image inside the optical system (para. 0067).

Regarding claim 16, Takeyama discloses the diffractive optical surface is arranged between the object and the intermediate image (Fig. 1). The intermediate image occurs at the convergence of the light beams shown prior to the diffractive surface in the optical path.

Regarding claim 17, Takeyama discloses the diffractive optical surface is provided at a position, which is closer to a pupil image-forming position of the light rays from the object than to the object (Fig. 1).

Regarding claim 26, Takeyama discloses an image-forming device (5) forming an original image and an optical system guiding light from the original image to a viewer's eye or to a projection surface (para. 0034).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3 and 7-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeyama (US 2002/0039232) in view of Yamazaki (US 6,687,057).

Regarding claim 3, Takeyama teaches the invention as claimed but lacks reference to the diffractive surface being the second surface. Yamazaki teaches the diffractive surface being the second surface in a prism (col. 5 lines 24-29). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the Takeyama invention include the diffractive surface on the second surface as taught by Yamazaki for the purpose of reducing the number of optical elements present in the optical path.

Regarding claims 7-12, Takeyama teaches the invention as claimed but lacks reference to the symmetry of the diffractive surface. Yamazaki teaches the use of both rotationally

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symmetric (col. 10 lines 10-12) and asymmetric (col. 7 lines 50-51) diffractive surface.

Yamazaki further teaches the use of both symmetric and asymmetric phase distribution (abstract). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the Takeyama diffractive surface to have the symmetry of Yamazaki for the purpose of minimizing aberrations during diffraction.

Claims 18-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeyama (US 2002/0039232) in view of Takagi (US 2003/0107816).

Regarding claims 18 and 22, Takeyama teaches the invention as claimed including a third surface (4₃) but lacks reference to the claimed optical path. Takagi teaches the use of an optical system with a first (31b), second (31c) and third (31a) surface. Takagi further teaches the light transmitting through the third surface, reflecting off the first surface, reflecting off the second surface, reflecting off the first surface, reflecting off the third surface and transmitting through the first surface (Fig. 2). In another embodiment Takagi teaches a first (D), second (C) and third (B) surface and the light transmitting through the third surface, reflecting off the first surface, reflecting off the second surface, reflecting off the first surface, reflecting off the second surface, reflecting off the first surface, reflecting off the third surface and transmitting through the first surface (Fig. 16). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the Takeyama reference have the optical path of Takagi for the purpose of reducing the light intensity to a desired level while minimizing the aberrations in the image.

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Regarding claims 19, 21, 23 and 25, Takeyama teaches the invention as claimed but lacks reference to the angle of reflection. Takagi further teaches the angle formed on reflection at the second surface being less than 60-degrees (para. 0089). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the Takeyama reference have the optical path of Takagi for the purpose of reducing the light intensity to a desired level while minimizing the aberrations in the image.

Regarding claims 20 and 24, Takeyama teaches the invention as claimed but lacks reference to the claimed optical path. Takai teaches a first (31b), second (32c) and third (31a) surface and transmission through the first and third surfaces and reflection at the first, second and third surfaces (Fig. 2). The claims do not require that the events listed in the claim limitations happen in any certain order. The prior art teaches that the claimed events occur and therefore meet the claim limitations. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the Takeyama reference have the optical path of Takagi for the purpose of reducing the light intensity to a desired level while minimizing the aberrations in the image.

Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takeyama (US 2002/0039232) in view of Sekita (US 5,917,662).

Takeyama teaches the invention as claimed but lacks reference to a photoelectric conversion device. Sekita teaches the use of a photoelectric conversion device (col. 7 lines 34-36) in an optical system forming an object image on a light-receiving surface of the photoelectric conversion device (Fig. 5). It would have been obvious to one of ordinary skill in the art at the

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time the invention was made to have the Takeyama optical device used in a photoelectrical conversion device as taught by Sekita for the purpose of recording an object image.

Conclusion

Applicant is advised that if the claims 18, 20, 22 and 24 are meant to claim a sequence of events the applicant must add claim language to the current claim limitations. The examiner suggests claim language such as, "along an optical path including in order," or "light received from the first surface reflected by the third surface," to impart the desired sequence.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joshua L. Pritchett whose telephone number is 571-272-2318. The examiner can normally be reached on Monday - Friday 7:00 - 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew A. Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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JLP *JP*



DREWA. DUNN
SUPERVISORY PATENT EXAMINER